

Docket No. F-8019

Ser. No. 10/699,136

AMENDMENTS TO THE CLAIMS:

Please replace the claims with the claims provided in the listing below wherein status, amendments, additions and cancellations are indicated.

1. (Currently Amended) A method of internally cleaning a coil pipe of a heat exchanger, said heat exchanger including an outlet and an inlet providing fluid communication with said coil pipe, said method comprising:

(1) flushing said coil pipe in a first flow direction by:

connecting a first end of a suction hose to said heat exchanger inlet;

connecting a second end of said suction hose to a suction pump and

a waste-and-wash water collecting tank; and

connecting one end of an ice-feeding hose to said heat exchanger outlet and a second end of said ice-feeding hose to a hopper;

~~preparing ice in the form of a cube having a side length of about 1/3-2/3 of an inside diameter of said heat exchanger coil pipe;~~

~~mixing ice and water are mixed in ratio of 1 (ice) to 4-6 (water);~~

supplying said an ice and water mixture into said hopper;

engaging said suction pump so that the ice and water are suctioned into said coil pipe outlet, pass internally through said coil pipe in a reverse

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flow direction towards said inlet, exit said inlet, and collect in said waste-and-wash water collecting tank;

~~providing a transparent portion in said ice-feeding hose for enabling visual inspection the flow of waste-and-wash water therethrough;~~

(2) flushing said coil pipe in a second flow direction by:

connecting said first end of said suction hose to said heat exchanger outlet;

connecting said second end of said suction hose to said suction pump and said waste-and-wash water collecting tank; and

connecting said one end of said ice-feeding hose to said heat exchanger inlet and said second end of said ice-feeding hose to said hopper;

supplying said ice and water mixture into said hopper;

engaging said suction pump so that the ice and water are suctioned into said coil pipe inlet, pass internally through said coil pipe in a normal flow direction towards said outlet, exit said outlet, and collect in said waste-and-wash water collecting tank;

(3) alternately flushing said coil pipe in said first and second flow directions for cleaning said coil pipe.

2-5. (Cancelled)

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6. (Currently Amended) A method of internally cleaning a copper coil pipe of a heat exchanger, said heat exchanger including an outlet and an inlet providing fluid communication with said coil pipe, said method comprising:

(1) flushing said coil pipe in a first flow direction by:

connecting a first end of a suction hose to said heat exchanger inlet;
providing a carriage and disposing a suction pump and a waste-and-wash water collector tank on said carriage;

connecting a second end of said suction hose to said suction pump and said waste-and-wash water collecting tank; and

connecting one end of an ice-feeding hose to said heat exchanger outlet and a second end of said ice-feeding hose to a hopper;

~~preparing ice in the form of a cube having a side length of about $\frac{1}{3}$ - $\frac{2}{3}$ of an inside diameter of said heat exchanger coil pipe;~~

~~mixing ice and water are mixed in ratio of 1 (ice) to 4-6 (water);~~

supplying said an ice and water mixture into said hopper;

engaging said suction pump so that the ice and water are suctioned into said coil pipe outlet, pass internally through said coil pipe in a reverse flow direction towards said inlet, exit said inlet, and collect in said waste-and-wash water collecting tank;

~~providing a transparent portion in said ice feeding hose for enabling visual inspection the flow of waste-and-wash water therethrough;~~

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(2) flushing said coil pipe in a second flow direction by:

connecting said first end of said suction hose to said heat exchanger outlet;

connecting said second end of said suction hose to said suction pump and said waste-and-wash water collecting tank; and

connecting said one end of said ice-feeding hose to said heat exchanger inlet and said second end of said ice-feeding hose to said hopper;

supplying said ice and water mixture into said hopper;

engaging said suction pump so that the ice and water are suctioned into said coil pipe inlet, pass internally through said coil pipe in said a normal flow direction towards said outlet, exit said outlet, and collect in said waste-and-wash water collecting tank;

(3) alternately flushing said coil pipe in said first and second flow directions;

whereby impact energy of said ice cubes and force from said water through said coil pipe and suction hose into said waste-and-wash water collecting tank clean said coil pipe.

7. (New) The method according to claim 1, further comprising providing a transparent portion in said ice feeding hose for enabling visual inspection the flow of waste-and-wash water therethrough.

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8. (New) The method according to claim 6, further comprising providing a transparent portion in said ice feeding hose for enabling visual inspection the flow of waste-and-wash water therethrough.
9. (New) The method according to claim 1, wherein the ice and water are mixed in ratio of 1 (ice) to 4~6 (water).
10. (New) The method according to claim 6, wherein the ice and water are mixed in ratio of 1 (ice) to 4~6 (water).
11. (New) The method according to claim 1, wherein the ice is prepared in the form of a cube having a side length of about $1/3$ - $2/3$ of an inside diameter of said heat exchanger coil pipe.
12. (New) The method according to claim 6, wherein the ice is prepared in the form of a cube having a side length of about $1/3$ - $2/3$ of an inside diameter of said heat exchanger coil pipe.

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13. (New) A method of internally cleaning a heat exchanger having at least two coil pipes interconnecting an inlet header and an outlet header, said method comprising:

supplying an ice and water mixture into a hopper;

connecting said hopper to a one of said inlet header and said outlet header;

and

applying suction to a remaining one of said inlet header and said outlet header so that the ice and water mixture is suctioned into said one of said inlet header and said outlet header, and simultaneously pass internally through said at least two coil pipes.

14. (New) The method according to claim 13, wherein said one of said heat exchanger inlet header and said outlet header is said inlet header, and said remaining one of said inlet header and said outlet header is said outlet header.

15. (New) The method according to claim 14, further comprising repeating said method wherein said one of said heat exchanger inlet header and said outlet header is said outlet header and said remaining one of said inlet header and said outlet header is said inlet header.

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16. (New) The method according to claim 15, further comprising repeating said method wherein said one of said heat exchanger inlet header and said outlet header and said remaining one of said inlet header and said outlet header is alternately switched between said inlet header and said outlet header, respectively.

17. (New) The method according to claim 15, wherein said coil pipes are non-corrugated.